

REMARKS

This communication is in response to the Office Action dated January 26, 2009. Claims 11-20 remain pending, claims 1-10 were previously cancelled and claims 11-20 are rejected. By this communication, claims 11, 12 and 13 are amended. Support for the amended subject matter can be found, for example, on page 11, paragraph [0022], pages 14-15, paragraphs [0029] and [0030], and Figure 15 of Applicants' disclosure.

Rejection Under 35 U.S.C. §101

Claims 11-20 are rejected under 35 U.S.C. §101 on the grounds that the claimed invention is allegedly directed to non-statutory subject matter. In particular, the Office asserts that claims 11-13 appear to have no practical application and no tangible result after the analyzing step being performed that is useful or transformed to another state or thing. Applicants respectfully traverse this rejection.

To determine whether patent-eligible subject matter is being claimed, the "useful, concrete, and tangible result" inquiry has been concluded as inadequate and the machine-or-transformation test outlined by the Supreme Court has been reaffirmed as the proper test to apply. *In re Bilski*, 545 F. 3d 943 (Fed. Cir. 2008). Under *Bilski*, a claimed process is patent-eligible under § 101 if: (1) it is tied to a particular machine or apparatus, or (2) it transforms a particular article into a different state or thing. *Id.* at 954. With respect to the latter prong of this test, it is sufficient if data representing an underlying physical object is transformed. *Id.* at 963.

Claims 11-12 recite, *inter alia*, "an input control unit receiving input data including at least dimensions of a semiconductor chip and an interposer, and bond

wire coordinate information for connecting the semiconductor chip to the interposer", "a creating unit that creates simulated design data that simulates, based on the input data, an occurrence of deviation in an arrangement position of the semiconductor chip on the interposer and an occurrence of deviation in bond wire connection terminal positions of the interposer" and "an analyzing unit [that] outputs analysis results that are used to design a semiconductor package based on the input data and the manufacturing deficiencies" or tolerances. Claim 13 recites analogous subject matter. These recitations satisfy at least the second prong of the *Bilski* test (i.e., transformation of data representing a particular article to a different state or thing). As noted above, the court in *Bilski* stated that the transformation of data that represents a physical object or substance meets the test; the claim is not required to involve any transformation of the underlying physical object itself. *Id.*

First, the claimed apparatus receives an input of data representing the physical parameters of the semiconductor package. Second, that data is manipulated in the creating unit to transform the physical structures represented by the data, e.g. by simulating deviations in relative positions of the semiconductor chip and the interposer. Third, the analysis results that are the subject of claims 11-13 are not abstract concepts. Rather, they are physical measurements (e.g., fluctuation tolerances) that pertain to physical devices and that can be reproduced. Since the claims clearly recite that it is input data (or information) that is being transformed, and this input data represents physical attributes of a semiconductor package, they are limited to a particular physical application, and therefore further meet the requirements for patent-eligible subject matter under 35 U.S.C. 101, according to the standard set forth by the Federal Circuit.

Accordingly, Applicants respectfully request that the rejection of claims 11-20 under 35 U.S.C. §101 be withdrawn.

Rejection Under 35 U.S.C. §112

Claims 11 and 12 are rejected under 35 U.S.C. §112, second paragraph, for allegedly being indefinite. In particular, the Office asserts that the recitation "fluctuation arrangement" renders the claims indefinite because it is unclear what "fluctuation" means. Applicants have amended claims 11 and 12 to further clarify the claimed subject matter. Accordingly, Applicants respectfully request that this rejection be withdrawn.

Rejection Under 35 U.S.C. §103

Claims 11-20 are rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over *Eka et al.* (U.S. Patent No. 6,357,036, hereinafter *Eka*) in view of *Bon et al.* (U.S. Patent Publication No. 2001/0044660, hereinafter *Bon*). Applicants respectfully traverse this rejection.

Eka discloses a computerized method and apparatus for locating bond pads and designing wire bond diagrams for a semiconductor device. In the method, bond pad location data is retrieved from the circuit design. From the retrieved pad location data and a list representing the connectivity between various pins on the semiconductor device and the corresponding bond pads, a database is created representing pad layer coordinates and pin assignments. Package information and the created database is fed to a design rule check utility which checks angles and distances of leads from the package leads to silicon pads to determine whether a bonding rule violation has occurred. If a bonding rule violation has occurred, a

program utility alerts the user of the violation to allow for the violation to be corrected manually. The program utility may also be programmed to automatically correct for bonding rule errors by relocating pads on the silicon design. In either instance, an AUTOCAD file may be produced comprising the revised bonding diagram once the bonding diagram meets all design rule criteria. (See *Eka*, col. 4, line 47 to col. 5, line 35).

As discussed above, *Eka* merely discloses generating a wire bonding diagram from extracted package information and pad layout data, and applying bonding design criteria to the resultant bonding diagram to determine whether all bonds are within established guidelines. Based on the result of applying the bonding design criteria, one or more bonding pads may have to be relocated if an impermissible bond is formed. Hence, in *Eka*, the design criteria for determining whether the bonds are within established guidelines is not based upon the analysis of simulated variations in the relative arrangement of a semiconductor chip and an interposer, as recited in the claims of the instant application. Accordingly, *Eka* does not disclose "a creating unit that ***creates simulated design data simulating occurrence of deviation*** in an arrangement position of a semiconductor chip on an interposer and occurrence of deviation in bond wire connection terminal positions of the interposer; and an analyzing unit that ***analyzes, based on the simulated design data, deficiencies in manufacturing of semiconductor devices due to the deviation*** in the arrangement position of the semiconductor chip on the interposer and the deviation in the bond wire connection terminal positions of the interposer" as recited in independent claim 11, and as similarly recited in independent claims 12 and 13.

Bon also does not disclose the concept of creating and analyzing ***simulated*** bond wiring design data. *Bon* merely discloses a method of adaptively compensating for variabilities of automated bonding machines by comparing groupings of bond pads, and identifying and correcting any shifts, rotations, or scalings of the bond pads.

Therefore, *Eka* or *Bon*, alone or in combination, cannot render independent claims 11-13 obvious to one skilled in the art. Claims 14-20, dependent from independent claim 13, are patentable at least for the reasons stated above with respect to independent claim 13. Accordingly, Applicants respectfully request that the rejection of claims 11-20 under 35 U.S.C. §103(a) be withdrawn.

Conclusion

Based on at least the foregoing amendments and remarks, Applicants submit that claims 11-20 are allowable, and that this application is in condition for allowance. Accordingly, Applicants respectfully request a favorable examination and consideration of the instant application. In the event the instant application can be placed in even better form, Applicants request that the undersigned attorney be contacted at the number below.

Respectfully submitted,

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